

# Oversight News

Newsletter of the Commonwealth's environmental oversight of the Paducah Gaseous Diffusion Plant

## Groundwater Cleanup Initiative Approved

A major milestone was achieved Aug. 9 in the ongoing effort to clean up contaminated groundwater at the Paducah Gaseous Diffusion Plant (PGDP). Representatives of the state Environmental and Public Protection Cabinet, U.S. Environmental Protection Agency and U.S. Department of Energy signed and approved a Record of Decision for a \$40 million interim remedial action. The action will address subsurface sources of trichloroethylene (TCE) and other volatile organic compounds near the C-400 Cleaning Building – the area generally regarded as the most significant source of volatile organic contaminants found in groundwater at the PGDP.

The C-400 remedial action is without question the most significant attempt to date to substantially curtail the PGDP's groundwater contamination problem.



(left to right) Bill Murphie, U.S. Department of Energy; Bruce Scott, Kentucky Division of Waste Management; and Kenneth Lapierre, U.S. Environmental Protection Agency, stood next to a map of groundwater contaminant plumes. Photo by Jeannie Brandstetter, courtesy of DOE.

The primary goal is to remove highly concentrated TCE (present in the form of dense non-aqueous phase liquid, or DNAPL) extending to depths of 100-plus feet beneath the surface. Once removed, the TCE can no longer continue polluting the groundwater. It's hoped that this action will remove more than 90 percent of the TCE known to be present at C-400 – significantly reducing the amount of time that groundwater beneath and north of the plant remains contaminated.

While design and installation of the heating system will be complicated, the process of removing the TCE is rather simple. To be effective, the action will require that numerous electrodes be installed to depths of approximately 100 feet throughout C-400 Building area. Electricity passed through these electrodes will be used to heat subsurface sediments and groundwater above TCE's boiling point, liberating TCE vapor. The vapor will then be removed from the subsurface using vacuum extraction wells and be collected or destroyed.

Several steps still must take place before this interim remedy is fully functional. System design will require about a year, with construction and operation occurring over the following three years. The remedy, considered interim because it's unlikely that any currently available technology can completely remove all DNAPL from the C-400 site, is scheduled to be complete by 2010.

By Todd Mullins, Ky. Division of Waste Management, Hazardous Waste Branch

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# Facilities Slated for Demolition

On June 15, the Kentucky Division of Waste Management received an engineering evaluation/cost analysis (EE/CA) from the Department of Energy (DOE) for the removal of three inactive facilities at the Paducah Gaseous Diffusion Plant (PGDP).

Potential contaminants of concern discussed within this EE/CA include asbestos, polychlorinated biphenyls (PCBs), and radionuclides (e.g., cesium-137, neptunium-237, plutonium-239, technetium-99, thorium-230, and uranium isotopes). The work associated with this project will be completed with a funding supplement to the PGDP fiscal year 2005 cleanup budget. A portion of the funding increase has been allocated to accelerate the cleanup schedule for the C-402 Lime House, C-405 Incinerator, and C-746-A West End Smelter. This EE/CA evaluates two removal alternatives for the three facilities:

- Alternative 1 – No action.
- Alternative 2 – Remove contents, demolish structures, characterize and dispose of wastes.

The “no action” alternative is a requirement that must be considered when attempting a cleanup action under the Comprehensive Environmental Response, Compensation and Liability Act (more commonly known as Superfund).

It is also the alternative that others will be compared to. Alternative 2 is an \$8.5 million action that includes the demolition and removal of the three facilities, leaving only their foundations. With Alternative 2, DOE believes it is safer to dismantle the buildings than allow them to deteriorate and potentially result in an uncontrolled release of contaminated dust, equipment, or building materials. Alternative 2 does not address any soil contamination existing beneath or around the buildings. Any contamination existing below the ground surface will be investigated and addressed by DOE as part of a later cleanup action.

Kentucky regulators completed a review of the EE/CA on July 6. The division generally agrees with DOE’s recommendation to proceed with Alternative 2. However, division regulators issued a comment letter to DOE seeking further information and clarification on a few items. As a result, DOE is required to submit a revised version of the EE/CA that addresses the state’s concerns. Once the state approves the revised EE/CA, a public comment period lasting at least 30 days will ensue.

*By Brian Begley, Ky. Division of Waste Management, Hazardous Waste Branch*

## State Evaluates Southwest Plume Report

The Kentucky Division of Waste Management has completed its initial review of the Department of Energy’s (DOE) site investigation report for the Southwest Groundwater Plume and is anticipating the receipt of a revised report in September.

The report presents the findings of the investigation, the purpose of which was to confirm or eliminate from further consideration several areas thought to be possible sources of dissolved phase trichloroethylene (TCE) and technetium-99 contamination to the plume. The areas investigated were the C-747-C Oil Landfarm, the northeast and southeast corners of the C-720 Building, a storm sewer running from the C-400 Building to Outfall 008 and the C-747 Contaminated Burial Yard. A summary of the report’s conclusions can be found in the Winter 2005 issue of Oversight News, online at <http://www.waste.ky.gov/programs/hw/PGDP+Oversight+News.htm>.

The division’s review of the report, while mostly favorable, identified several areas within the groundwater modeling portion of the text requiring further explanation. The division’s comments expressed concern over the lack

of clarity within this portion of the document and the fact that some of the numerical values listed were not well-substantiated in the text. For example, DOE has chosen to use a figure of 26.6 years in its model to represent the amount of time that would be required for one-half of the TCE released from a particular source to degrade within the Regional Gravel Aquifer, the uppermost aquifer at the PGDP site. The division was unable to determine how this value was computed and has asked DOE to provide this information.

Once the division’s questions are answered to its satisfaction, the report will be deemed technically sound and will be approved. Approval of the report by the division and the U.S. Environmental Protection Agency will be followed by submittal of a proposed remedial action plan for the Southwest Plume. The proposed plan will list the various alternatives considered to address issues defined in the report and will present a preferred alternative. Following approval of this document by the division and EPA, the proposed plan will be presented to the public for review and comment.

*By Todd Mullins, Ky. Division of Waste Management, Hazardous Waste Branch*

## Sampling of On-Site Ditches Begins

**R**egulators and representatives of the Department of Energy (DOE) have resolved a dispute over sampling requirements for an investigation of on-site drainage features at the Paducah Gaseous Diffusion Plant (PGDP).

A site investigation and risk assessment of the Surface Water Operable Unit will involve sampling on-site areas that have the greatest potential for surface water discharges of contaminants into the creeks surrounding the industrial portion of the PGDP. These areas are sections 3, 4, and 5 of the North-South Diversion Ditch; PGDP outfalls 002, 008, 010, 011, 012 and 015 and associated internal ditches and areas; and storm water sewers associated with the C-333-A, C-337-A, C-340, C-535 and C-537 facilities.

The sampling and analysis plan for the project calls for collecting surface soil and sediment data in the ditches by two procedures, or “activities.” Activity 1 requires testing samples for uranium-238, cesium-137 and total PCBs. This limited set of parameters is thought to indicate or be associated with the presence of other contaminants of concern. The data will be used to identify the location and extent of “hot spots” of contamination. Activity 2 requires testing samples for bulk inorganics (metals), trichloroethylene, 1,1,1-trichloroethane, polycyclic aromatic hydrocarbons (PAHs), PCBs and radionuclides. Activity 2 data will be used to assess risks to human health and the environment associated with measured levels of these contaminants.

In all, 2,613 Activity 1 samples and 381 Activity 2 samples are planned. In general, about every seventh sample taken along the ditches will be analyzed for the more comprehensive Activity 2 parameters. Samples that exceed established indicator levels will trigger additional contingent sampling.

In addition, up to 96 water samples will be collected to evaluate the storm sewers. This sampling will be followed by direct-push soil sampling based on the results of the water quality data.

In January, the Kentucky Division of Waste Management conditionally concurred with the second-draft sampling and analysis plan. A condition of the division’s approval was a requirement that PAHs be included as an Activity 1 indicator parameter. DOE disputed this issue. By the conclusion of a May 4, 2005 meeting, DOE had clarified to regulators’ satisfaction that PAHs would be adequately addressed in the proposed sampling plan without making them an Activity 1 indicator parameter.

After DOE submitted a revised sampling and analysis plan incorporating the language agreed to in the May 4 meeting, the division approved the plan on May 13, 2005. With the dispute resolved, DOE contractors began sampling in late June. Activities identified in the approved plan are currently ongoing.

*By Brian Baker, Ky. Division of Waste Management, Hazardous Waste Branch*

## Scrap Metal Shipments Resume

**T**he Department of Energy (DOE) is once again shipping low-level radioactive scrap metal from the Paducah Gaseous Diffusion Plant (PGDP) after

completing a reauthorization process required by the destined disposal facility.

Shipments to the Nevada Test Site (NTS) were halted last year after items were found that did not conform to NTS waste acceptance criteria. As part of the reauthorization, scrap inspection procedures and screening methodologies were revised in order to eliminate the presence of non-conforming items in waste shipments, increase shipment volumes, and maintain the disposal schedule.

Meanwhile, other aspects of the scrap removal project have made progress. Approximately 415 tons of classified scrap from the C-746-D yard have been packaged and



**Work to clear tons of scrap metal from outdoor yards continues.** Photo by Gaye Brewer, Ky. Department for Environmental Protection.

*(continued on page 6)*

## Activities to Include Public Comment

The Kentucky Division of Waste Management anticipates several opportunities in 2005 for the public to voice opinions, comments or concerns for the state's consideration deciding on cleanup or permitting activities at the Paducah Gaseous Diffusion Plant (PGDP).

The division posts all public notices on the Internet at the following Web address: <http://www.waste.ky.gov/news/default.htm>. Scroll down the page to the heading "Hazardous Waste Sites" to check for any current public notices related to Superfund cleanup or the management of hazardous or mixed (i.e., both hazardous and radioactive) waste at the PGDP site. Please note: Any public notices related to the Department of Energy's solid waste landfills at the site would be posted under the "Solid Waste Sites" heading.

Dates for the anticipated public comment periods have not been finalized. Periodically check the Web address above for public notices related to the following:

- A major modification to the Department of Energy's hazardous waste management permit at the PGDP. Updates are expected to include: identifying areas where hazardous waste was found to be stored without a permit, revising information about DOE Material Storage Areas, updating information for two of the waste streams generated at PGDP, coordinating the due date of annual groundwater flow rate information with that of a related report, clarifying information

about tank inspections, and deleting references to information no longer required on the hazardous waste annual report form.

- A major modification to the Federal Facility Agreement, the document that guides site cleanup. The modification would incorporate changes to completion dates for the Groundwater and Surface Water Operable Units.
- A major modification to the Site Treatment Plan, a document describing the capacities and technologies available for treating mixed waste generated at PGDP. DOE may propose changes to compliance dates for completion of some of the treatment activities.
- A closure plan for DOE Material Storage Areas where hazardous wastes were found to be stored without a permit.

The division announces each public comment period by publishing a public notice in a major local newspaper of general circulation (the Paducah Sun). Copies of public notices are also mailed to each individual who has requested to be on a mailing list to receive such publications. If you would like to be added to the public notice mailing list or verify your address on the list, contact Jon Maybriar of the Hazardous Waste Branch at (502) 564-6716.

*By Lauren McDonald, Ky. Division of Waste Management, Hazardous Waste Branch*

## Personnel News

Personnel changes have taken place recently in the Paducah Gaseous Diffusion Plant (PGDP) section of the Kentucky Hazardous Waste Branch.

**Mike Welch** retired on July 29 after serving 12 years as branch manager. He was a familiar face in Paducah, having often served as hearing officer for public hearings related to hazardous waste issues and activities at the plant. Prior to his appointment with the Hazardous Waste Branch, Mike worked with the Kentucky Pollutant Discharge Elimination System program of the Division of Water. He had 20 years of state service. Mike's valuable experience, his open mind and even-handedness in dealing with tough regulatory issues, and his friendly demeanor will be missed by many.

**April Webb** became Hazardous Waste Branch manager

on Aug. 1. April was supervisor of the branch's Permit Review section for the past two years. She has a Bachelor of Science degree in Chemical Engineering from the University of Kentucky and received her Professional Engineering license in environmental engineering in January 2003. Prior to her existing job, April worked in the Division for Air Quality for six years.

**Brad Holland** has left the PGDP section, but has not ended his association with the site. He recently accepted a position with a contractor working at the PGDP. The Hazardous Waste Branch is working to fill Brad's position, which involves working from the Paducah Site Office to provide assistance with the state's independent sampling efforts, along with in-person oversight of the many environmental investigation and cleanup activities at PGDP.

# Work on Uranium Conversion Facility Advances

Construction may be under way by autumn on the main process building of a plant to convert depleted uranium hexafluoride ( $\text{DUF}_6$ ) to a more stable material.

More than 37,000 cylinders of  $\text{DUF}_6$  — a byproduct of uranium enrichment — are stockpiled at the Paducah Gaseous Diffusion Plant (PGDP). After officials expressed concerns about the safety of the material, Congress required the Department of Energy (DOE) to begin construction of the conversion plant by July 31, 2004. DOE met that mandate by breaking ground on July 27, 2004.

Since then DOE's contractor for the project, Uranium Disposition Services LLC (UDS), has completed site preparation activities. Piping and conduit for utilities have been laid, and a storm water collection basin has been built. Foundations from temporary support buildings used five decades ago during PGDP construction have all been removed from the area. In mid-July, UDS contractors mobilized equipment to the site to begin construction of a warehouse and other support buildings.

UDS has also submitted the final design package for the conversion process and facility to DOE for review and approval. UDS expects construction activity to peak next spring and summer, with 200 to 250 contractor and subcontractor personnel on site.

On June 27, UDS assumed responsibility for operations at the outdoor yards where DOE's cylinders are stored. Activities at the cylinder yards include regularly

inspecting the cylinders' condition, addressing any cylinder defects, performing radiological surveys, and maintaining the pads on which the cylinders rest.

The facility will convert  $\text{DUF}_6$  to uranium oxide, which is more stable, and aqueous hydrogen fluoride, a product that can be sold commercially. If DOE can't find a market for the hydrogen fluoride, it will be converted to calcium fluoride within a separate building at the facility.

The Kentucky Division for Air Quality (DAQ) has reviewed the facility's permit application and determined the type of air permit required. After examination of potential air emissions associated with the conversion facility — uranium oxide, hydrogen fluoride and particulates — the DAQ recommended a federally enforceable Conditional Major permit. This type of air permit requires the source to restrict potential emissions to a level below a major source threshold through the use of control equipment and/or operational limitations.

The DAQ released a draft air quality permit for the conversion facility on May 11 for public comment. The draft permit defines the conditions and limitations under which the conversion facility will be allowed to be constructed and to operate. The draft permit identifies each emission point and associated emission control systems or equipment. It defines limitations in the operation of emission controls, limits that emissions may not exceed, and how the permittee will demonstrate compliance with these limitations. The draft permit also identifies testing, monitoring, recordkeeping and reporting requirements.

The public comment period ended on June 10. The only comments received on the draft were recommendations and requests from UDS. The U.S. Environmental Protection Agency (EPA) now has a 45-day period in which to review the permit and comment, if desired. As a Conditional Major source, the permittee may begin construction, but may not begin operations until any EPA comments are resolved and the final permit is issued. The Division for Air Quality is now considering the source's comments and is preparing the final permit.

UDS will start up and operate the conversion plant through the end of its contract in February 2011. After that, the operations contract will again be up for bid.



Contractors position a bridge component at the construction site for a uranium conversion plant. Photo courtesy of Uranium Disposition Services, LLC.

By Lauren McDonald, Ky. Division of Waste Management, Hazardous Waste Branch, and Sandra Cooke, Ky. Division for Air Quality

**Environmental and Public Protection Cabinet**

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[www.waste.ky.gov/programs/hw/PGDP+Section.htm](http://www.waste.ky.gov/programs/hw/PGDP+Section.htm)

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## Scrap Metal Shipments Resume

are currently awaiting shipment to NTS. In May 2005, DOE contractors completed the task of repackaging a large collection of deteriorated drums containing machine turnings. As of July, 56 of 239 shipping containers of machine turnings had been sent to Envirocare of Utah for disposal.

An upcoming project in the planning stages will involve the collection, inspection, shredding, containerization and disposal of wooden pallets throughout the scrap yards.

The removal project involves about 44,000 tons of scrap metal piled in 10 outdoor yards at the PGDP. About 7,000 tons of material had been disposed at the time scrap shipments to NTS were suspended.

**By Leo Williamson, Ky. Division of Waste Management, Hazardous Waste Branch**

**Kentucky Environmental Oversight News** is published quarterly by the Kentucky Department for Environmental Protection's Division of Waste Management. It features information regarding environmental cleanup activities at the Paducah Gaseous Diffusion Plant site and related topics.

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